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ABSTRACT

This flight test guide assists the applicant and his instructor in preparing for the Private or Commercial Pilot Rotocraft Certificate with Gyroplane Rating under Part 61 (revised) of Federal Aviation Regulations. It contains information concerning pilot operations, procedures, and maneuvers relevant to the flight test required for these certificates. Preflight Operations, airport and traffic pattern operations, normal and crosswind take offs and landings, straight and level flight, climbs, descents, turns, flight maneuvering by reference to ground objects, maneuvering at critically slow airspeeds, cross country flying, and emergency procedures are outlined. A suggested flight test checklist is included. (KP)

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FLIGHT TEST GUIDE

[Part 61 Revised]

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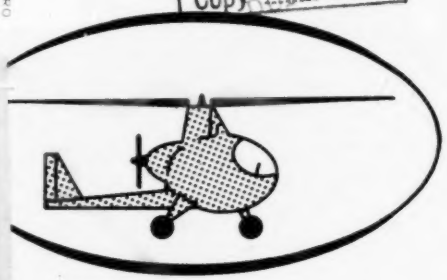

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PRIVATE and COMMERCIAL PILOT

Gyroplane

CE 000 387

1973

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

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AC 61-60

FLIGHT TEST GUIDE

[Part 61 Revised]

PRIVATE AND COMMERCIAL PILOT

Gyroplane

1973

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Flight Standards Service

PREFACE

Part 61 (revised) of Federal Aviation Regulations, effective November 1, 1973, establishes a new concept of pilot training and certification requirements. To provide a transition to these revised requirements, Part 61 (revised) permits the applicant, for a period of 1 year after the effective date, to meet either the previous requirements or those contained in the revised part. *AC 61–30A, Private and Commercial Pilot Gyroplane Flight Test Guide,* dated 1972, outlines the previous requirements.

This flight test guide, AC 61–60, has been prepared by Flight Standards Service of the Federal Aviation Administration to assist the applicant and his instructor in preparing for the flight test for the Private or Commercial Pilot Rotorcraft Certificate with Gyroplane Rating under Part 61 (revised). It contains information and guidance concerning the pilot operations, procedures, and maneuvers relevant to the flight test required for these certificates. A suggested flight test checklist is included for the convenience of those who may find such a checklist useful.

In addition to providing help to the applicant and his instructor, this guide will be useful to FAA Inspectors and designated

pilot examiners in the conduct and standardization of flight tests. Persons using this guide in connection with pilot training and flight tests should also refer to the applicable *Federal Aviation Regulations; Airman's Information Manual; Flight Training Handbook, AC 61–21; Basic Helicopter Handbook, AC 61–13;* and other pertinent advisory circulars.

Comments regarding this guide may be directed to Department of Transportation, Federal Aviation Administration, Flight Standards Technical Division, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

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APPLICANT'S FLIGHT TEST CHECKLIST
(Suggested)

APPOINTMENT WITH INSPECTOR

OR EXAMINER: Name _____

Time/Date _____

ACCEPTABLE GYROPLANE

- ☐ Aircraft Documents:
  - Airworthiness Certificate
  - Registration Certificate
  - Operating Limitations
- ☐ Aircraft Maintenance Records:
  - Airworthiness Inspections
- ☐ FCC Station License

PERSONAL EQUIPMENT

- ☐ Current Aeronautical Charts
- ☐ Computer and Plotter
- ☐ Flight Plan Form
- ☐ Flight Logs
- ☐ Current AIM

PERSONAL RECORDS

- ☐ Pilot Certificate
- ☐ Medical Certificate
- ☐ Signed Recommendation
- ☐ Written Test Results
- ☐ Logbook
- ☐ Notice of Disapproval (if applicable)
- ☐ Approved School Graduation Certificate (if applicable)
- ☐ FCC Radiotelephone Operator Permit
- ☐ Examiner's Fee (if applicable)

GENERAL INFORMATION

PILOT TRAINING AND CERTIFICATION CONCEPT

Part 61 of the Federal Aviation Regulations has been revised and upgraded to reflect the complexity of the modern aircraft as well as its operating environment. In the past, airman certification requirements could be met by training a student to pass a written test and then to demonstrate his ability to perform predetermined flight training maneuvers during a flight test. Rather than merely duplicating on the flight test the maneuvers used for training, the new training and certification concept requires that the applicant receive insruction in and demonstrate his competency in *all pilot operations* listed in pertinent sections of Part 61 (revised). A pilot operation, as used herein, is a group of related procedures and maneuvers involving skills and knowledge required to safely and efficiently function as a pilot. The specific procedures and maneuvers used to teach the pilot operations are not listed in Part 61 (revised). Instead, the instructor is permitted to select procedures and maneuvers from FAA-approved training publications pertinent to the certificate or rating sought.

The instructor indicates by logbook endorsement that the applicant has demonstrated competency in all the required pilot operations and considers him qualified to pass the flight test. On the flight test, the examiner[1] selects the procedures and maneuvers to be performed by the applicant to show competency in each required pilot operation.

The procedures and maneuvers appropriate to the Private and Commercial Pilot Rotorcraft Certificate with a gyroplane rating are contained in either *Flight Training Handbook, AC 61-21;* or *Basic Helicopter Handbook, AC 61-13;* or are those generally accepted by gyroplane operators and explained in this flight test guide.

USE OF THIS GUIDE

The pilot operations in this flight test guide, indicated by Roman numerals, are required by Part 61 (revised)—§ 61.107 for the private pilot and § 61.127 for the commercial pilot. This guide is intended only to outline appropriate pilot operations and the minimum standards for the performance of each procedure or maneuver which will be accepted by the examiner as evidence of the pilot's competency. It is not intended that the applicant be tested on every procedure or ma-

[1] The word "examiner" is used hereafter in this guide to denote either the Federal Aviation Administration Inspector or designated pilot examiner who conducts an official flight test.

neuver within each pilot operation, but only those considered necessary by the examiner to determine competency in each pilot operation. Certain procedures and maneuvers, pertinent *only* to the private pilot applicant or *only* to the commercial applicant, are so indicated. Procedures and maneuvers not so indicated apply to both applicants.

When, in the judgment of the examiner, certain demonstrations are impractical, competency may be determined by oral testing. Throughout the flight test several procedures/maneuvers may be evaluated concurrently, i.e., traffic patterns, straight-and-level flight, climbs, descents, and turns.

This guide contains an **Objective** for each required pilot operation. Under each pilot operation, pertinent procedures or maneuvers are listed with ***Descriptions*** and ***Acceptable Performance Guidelines.***

1. The **Objective** states briefly the purpose of each pilot operation required on the flight test.

2. The ***Description*** provides information on what may be asked of the applicant regarding the selected procedure or maneuver. The procedures or maneuvers listed have been found most effective in demonstrating the objective of that particular pilot operation.

3. The ***Acceptable Performance Guidelines*** include the factors which will be

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taken into account by the examiner in deciding whether the applicant has met the objective of the pilot operation. The airspeed, altitude, and heading tolerances given represent the minimum performance expected in good flying conditions. However, consistently exceeding these tolerances before corrective action is initiated is indicative of an unsatisfactory performance. Any procedure or action, or the lack thereof, which requires the intervention of the examiner to maintain safe flight will be disqualifying. Failure to exercise proper vigilance or to take positive action to ensure that the flight area has been adequately cleared for conflicting traffic will also be disqualifying.

Emphasis will be placed on procedures, knowledge, and maneuvers which are most critical to a safe performance as a gyroplane pilot. Areas of particular importance include spatial disorientation, collision avoidance, and wake turbulence hazards.

GENERAL PROCEDURES FOR FLIGHT TESTS

The ability of an applicant for a private or commercial pilot certificate, or for an aircraft or instrument rating on that certificate, to perform the required pilot operations is based on the following:

1. Executing procedures and maneuvers within the aircraft's performance capabilities and limitations, including use of the aircraft's systems.

2. Executing emergency procedures and maneuvers appropriate to the aircraft.

3. Piloting the aircraft with smoothness and accuracy.

4. Exercising judgment.

5. Applying his aeronautical knowledge.

6. Showing that he is the master of the aircraft, with the successful outcome of a procedure or maneuver never seriously in doubt.

If the applicant fails any of the required pilot operations he fails the flight test. The examiner or the applicant may discontinue the test at any time when the failure of a required pilot operation makes the applicant ineligible for the certificate or rating sought. If the test is discontinued the applicant is entitled to credit for only those entire pilot operations that he has successfully performed.

FLIGHT TEST PREREQUISITES

An applicant for the gyroplane pilot flight test is required by revised § 61.39 of the Federal Aviation Regulations to have: (1) passed the appropriate gyroplane pilot written test within 24 months before the date he takes the flight test, (2) the applicable in-

struction and aeronautical experience prescribed for the pilot certificate he seeks, (3) at least a second class medical certificate issued within the past 12 months for a commercial pilot or at least a third class medical certificate issued within the past 24 months for a private, (4) reached at least 17 years of age for a private or 18 years for a commercial, and (5) a written statement from an appropriately certificated flight instructor certifying that he has given the applicant flight instruction in preparation for the flight test within 60 days preceding the date of application, and finds him competent to pass the test and to have a satisfactory knowledge of the subject areas in which he is shown to be deficient by his airman written test report.

GYROPLANE AND EQUIPMENT REQUIREMENTS FOR FLIGHT TEST

The applicant is required by revised § 61.45 to provide an airworthy gyroplane for the flight test. This gyroplane must be capable of, and its operating limitations must not prohibit, the pilot operations required on the test. The following equipment is relevant to the pilot operations required by revised § 61.107 for the private pilot flight test, and by revised § 61.127 for the commercial pilot flight test:

1. Two-way radio suitable for voice communications with aeronautical ground stations.

2. A radio receiver which can be utilized for available radio navigation facilities (may be the same radio used for communications).

3. Engine and flight controls that are easily reached and operated in a normal manner by both pilots.

4. Operating instructions and limitations. The applicant should have an appropriate checklist, an Owner's Manual/Handbook, or, if required for the gyroplane used, an FAA-approved Gyroplane Flight Manual. Any operating limitations or other published recommendations of the manufacturer that are applicable to the specific gyroplane will be observed.

PILOT OPERATIONS
Procedures/Maneuvers

I. PREFLIGHT OPERATIONS

Objective

To determine that the applicant can ensure that he meets pilot requirements, that the gyroplane is airworthy and ready for safe flight, and that suitable weather conditions exist.

Procedures/Maneuvers

A. Certificates and Documents

1. Description The applicant may be asked to present his pilot and medical certificates and to locate and explain the gyroplane's registration certificate, airworthiness certificate, operating manual or FAA-approved Gyroplane Flight Manual (if required), equipment list, and required weight and balance data. In addition, he may be asked to explain gyroplane and engine logbooks or other maintenance records.

2. Acceptable Performance Guidelines The applicant shall be knowledgeable

regarding the locations, purpose, and significance of each required item.

B. Gyroplane Performance and Limitations

1. Description The applicant may be orally quizzed on the performance capabilities and approved operating procedures and limitations of the gyroplane used. This includes power settings, placarded speeds, and fuel and oil requirements. In addition, the manufacturer's published recommendations or FAA-approved Gyroplane Flight Manual should be used to determine the effects of temperature, pressure altitude, wind, and gross weight on performance.

2. Acceptable Performance Guidelines The applicant shall be evaluated on his ability to obtain, explain, and apply the information which is essential in determining the performance of the gyroplane used.

C. Weight and Balance

1. Description The applicant may be asked to demonstrate the application of the approved weight and balance data for the gyroplane used to determine that the gross weight and c.g. (center of gravity) location are within limits. Charts and graphs provided by the manufacturer may be used.

2. *Acceptable Performance Guidelines* The applicant's performance shall be evaluated on the basis of his ability to determine the empty weight, maximum gross weight, useful load (fuel, passengers, baggage) by reference to appropriate publications, and his ability to apply this information to determine that the gross weight and center of gravity are within approved limits.

D. Weather Information

1. Description The applicant may be asked to obtain Aviation Weather Reports, Area and Terminal Forecasts, and Winds Aloft Forecasts pertinent to the proposed flight.

2. *Acceptable Performance Guidelines* The applicant shall demonstrate that he knows what weather information is pertinent and how to best obtain this information, and that he can interpret and understand its significance with respect to his proposed flight.

E. Line Inspection

1. Description The applicant may be asked to demonstrate a visual check to determine the gyroplane's airworthiness and readiness for flight. This includes all required

equipment and documents. A checklist provided by the manufacturer or operator should be used.

2. Acceptable Performance Guidelines The applicant shall use an orderly procedure in conducting a preflight check of the gyroplane. He shall know the significance of each item checked and recognize any unsafe condition.

F. Gyroplane Servicing

1. Description The applicant may be asked to demonstrate a visual inspection to determine that the fuel is of the proper grade and type and the supply of fuel, oil, and other required fluids is adequate for the proposed flight. He should take appropriate action to eliminate possible fuel contamination in the gyroplane.

2. Acceptable Performance Guidelines The applicant shall know the grade and type of oil and fuel specified for the gyroplane and be able to determine the amount of fuel required to complete the flight. He shall know where to find all fuel and oil fillers, and the capacity of each tank, as well as the location of the battery. He shall also know the proper steps for avoiding fuel contamination during and following servicing.

G. Engine and Systems Preflight Check

1. Description The applicant may be asked to demonstrate a check to determine that the engine is operating within acceptable limits and that all systems, equipment, and controls are functioning properly and adjusted for takeoff. A checklist provided by the manufacturer or operator should be used.

2. Acceptable Performance Guidelines The applicant shall use proper procedures in engine starting and runup and in checking gyroplane systems, equipment, and controls to determine that the gyroplane is ready for flight. Careless operation in close proximity to obstructions, ground personnel, or other aircraft shall be disqualifying.

II. AIRPORT AND TRAFFIC PATTERN OPERATIONS

Objective

To determine that the applicant can safely and efficiently conform to arrival and departure procedures and established traffic patterns at controlled and noncontrolled airports, and can accomplish takeoffs and landings competently under various field and wind conditions.

Procedures/Maneuvers

A. Radio Communication and ATC Light Signals

1. Description The applicant may be asked to demonstrate the use of designated frequencies and recommended voice procedures to report position and state intentions regarding the flight and to obtain pertinent information and clearances. Where applicable, he is expected to use Airport Terminal Information Service, Airport Advisory Service, Control Tower, Approach and Departure Control, UNICOM, and ATC light signals.

2. Acceptable Performance Guidelines The applicant shall determine the type of communication facilities available, select correct frequencies, and use appropriate communications procedures to obtain and acknowledge necessary information. Failing to comply with airport traffic procedures or instructions without permission to do so shall be disqualifying.

B. Airport and Runway Markings and Lighting

1. Description Where available, the applicant may be asked to demonstrate the proper use of direction indicators; and markings indicating closed runways, displaced thresholds, taxiways, holding lines, and basic runways. He is also expected to be familiar

with taxiway and runway lighting, rotating beacons, obstruction lights, and Visual Approach Slope Indicator (VASI).

2. *Acceptable Performance Guidelines* The applicant shall know the meaning of standard landing direction indicators, markings and lighting, and how they relate to gyroplane operation. Failure to properly use these aids, creating an unsafe situation, shall be disqualifying.

C. Operation on the Surface

1. Description The applicant may be asked to demonstrate safe operating practices while in close proximity to other aircraft, persons and obstructions. Emphasis should be placed on use of brakes and power to control taxi speeds, proper positioning of flight controls for existing wind conditions, awareness of possible ground hazards, and compliance with taxi procedures and instructions. The applicant is expected to take extra precautions when taxiing behind large aircraft.

2. *Acceptable Performance Guidelines* The applicant shall maneuver the gyroplane on the surface without endangering persons or property or conflicting with a smooth and orderly flow of traffic.

D. Traffic Patterns

1. Description The applicant may be asked to demonstrate prescribed arrival and

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departure procedures. He is expected to maintain appropriate altitudes, airspeeds, and ground track consistent with instructions received or the established traffic pattern.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his ability to maneuver the gyroplane relative to the runway in use while properly applying wind drift corrections, maintaining adequate spacing in relation to other aircraft, as well as maintaining and controlling altitude and airspeed.

E. Normal and Crosswind Takeoffs

1. Description The applicant may be asked to perform normal and crosswind takeoffs. He should align the gyroplane with the desired direction of takeoff and then accelerate from a stationary position into forward movement. Directional control should be maintained, and aft cyclic applied as necessary to become airborne when the appropriate lift-off airspeed is reached. From this point, the gyroplane should be accelerated to best rate-of-climb airspeed.

In crosswind takeoffs, he should use rudder and lateral cyclic as necessary to correct for any drifting moment during the ground run. The "crab" method should be used when correcting for wind drift during the climb-out leg.

The applicant may be asked to make at least one crosswind takeoff with sufficient crosswind to require the use of crosswind technique, but not in excess of the crosswind limitations of the gyroplane used.

2. Acceptable Performance Guidelines The applicant's performance of normal and crosswind takeoffs shall be evaluated on the basis of power application, smoothness, wind drift correction, coordination, and directional control. The applicant shall maintain climb speed within ±5 MPH of the best rate-of-climb speed.

F. Normal and Crosswind Approaches and Landings

1. Description The applicant may be asked to perform normal and crosswind approaches and landings. The approaches should begin at not more than 1,000 ft. above the surface and a constant airspeed maintained, power off, throughout a 180° change in direction. As the surface is approached, the normal landing attitude should be attained and touchdown made in that attitude.

In crosswind approaches and landings, the applicant should correct for wind drift by means of a slip or crab, or a combination of these techniques. As the surface is approached, a crosswind landing attitude should be attained and ground contact made with wind drift

correction applied. This correction should be maintained during the landing roll.

The applicant may be asked to make at least one crosswind landing with sufficient crosswind to require the use of crosswind technique, but not to exceed the crosswind limitations of the gyroplane.

2. Acceptable Performance Guidelines The applicant's performance of normal and crosswind approaches and landings shall be evaluated on the basis of his landing technique, judgment, wind drift correction, coordination, power technique, and smoothness. He shall maintain the proper final approach speed within ±5 MPH and touchdown in the proper landing attitude within the portion of the runway or landing area specified by the examiner.

Touching down with an excessive side load on the landing gear and poor directional control shall be disqualifying.

G. Go-Around

1. Description The applicant may be asked to perform a go-around just prior to flare for touchdown. He should initiate the maneuver by adjusting power and attitude as necessary to establish the best rate-of-climb speed. The climb should be maintained until reaching traffic pattern altitude.

2. Acceptable Performance Guidelines The applicant shall perform a safe and

efficient go-around. His performance shall be evaluated on his prompt and smooth application of climb power while establishing proper climb attitude and maintaining directional control.

H. High Altitude Takeoff

1. Description The applicant may be asked to demonstrate a high altitude takeoff. He should initiate this takeoff in the same manner as the normal takeoff, except the ground run will be longer. Rotation should be initiated just prior to reaching best angle-of-climb airspeed. When lift-off occurs, the gyroplane should be accelerated near the surface until reaching best rate-of-climb airspeed.

2. Acceptable Performance Guidelines The applicant's performance of a high altitude takeoff shall be evaluated on the basis of power application, smoothness, wind drift correction, coordination, and directional control. The applicant shall maintain climb speed within ± 5 MPH of the best rate-of-climb speed.

I. High Altitude Approach and Landing

1. Description The applicant may be asked to demonstrate a high altitude approach and landing. He should establish a stabilized final approach at normal power-off approach airspeed, but with sufficient power applied to maintain an approach angle of 10° or less.

Corrections to the angle of approach should be made with throttle. As the gyroplane nears the surface, the landing attitude should be attained and throttle reduced as necessary to complete a smooth touchdown. After touchdown, the throttle should be completely closed.

2. *Acceptable Performance Guidelines* The applicant's performance of a high altitude approach and landing shall be evaluated on the basis of his landing technique, judgment, wind drift correction, coordination, power technique, and smoothness. He shall maintain the proper final approach speed within ±5 MPH and touchdown in the proper landing attitude within the portion of the runway or landing area specified by the examiner.

Touching down with an excessive side load on the landing gear and poor directional control shall be disqualifying.

J. Maximum Performance (Short-Field) Takeoff and Landing

1. Description The applicant may be asked to demonstrate a *maximum performance* takeoff from a field with assumed obstacles. He should align the gyroplane with the desired direction of takeoff, release brakes, and apply full power. He should rotate for lift-off just as the best angle-of-climb airspeed is reached. He should maintain that airspeed until clear of the assumed obstacles, then ac-

celerate to the best rate-of-climb speed. The applicant should know and understand the effectiveness of the best rate-of-climb and best angle-of-climb airspeeds to obtain maximum climb performance.

The applicant may be asked to demonstrate a *short-field approach and landing* from over an assumed 50-ft. obstacle. He should establish a final approach with a moderately low power setting, using an airspeed which will result in little or no floating during the flare. Touchdown should be made in a normal landing attitude within the area specified by the examiner. As the touchdown is made, the throttle should be closed.

2. *Acceptable Performance Guidelines* The applicant's performance shall be evaluated on the basis of his planning, coordination, smoothness, and accuracy.

In the *maximum performance takeoff*, the liftoff and climb-out shall be performed within ±5 MPH of the best angle-of-climb airspeed until the assumed obstacle is cleared, and then the airspeed shall be maintained within ±5 MPH of the best rate-of-climb airspeed.

In the *short field approach and landing*, the applicant shall adequately clear the assumed obstacle, and touchdown in the proper landing attitude beyond and within 100 ft. of a line or mark designated by the examiner. Loss of directional control during the landing roll shall be disqualifying.

K. Soft-Field Takeoff

1. Description The applicant may be asked to demonstrate a soft-field takeoff. He should initiate this takeoff in the same manner as the normal takeoff, except the rotor disc should be held in a relatively high angle of attack to lighten the load on the landing gear as soon as possible. Lift-off should be made at the minimum possible airspeed, and the landing gear held just clear of the surface until best rate-of-climb airspeed is reached.

2. Acceptable Performance Guidelines The applicant's performance of a soft-field takeoff shall be evaluated on the basis of power application, smoothness, wind drift correction, coordination, and directional control. The applicant shall maintain climb speed within ± 5 MPH of the best rate-of-climb speed.

L. Soft-Field Approach and Landing

1. Description The applicant may be asked to demonstrate a soft-field approach and landing. He should initiate the final approach using an airspeed compatible with the softest possible touchdown. As the gyroplane nears the surface, the landing attitude should be attained and the touchdown completed as softly as possible. Heavy braking should be avoided during the landing roll.

2. Acceptable Performance Guidelines The applicant's performance of a soft-

field approach and landing shall be evaluated on the basis of his landing technique, judgment, wind drift correction, coordination, power technique, and smoothness. He shall maintain the proper final approach speed within ±5 MPH and touch down in the proper landing attitude within the portion of the runway or landing area specified by the examiner.

M. Collision Avoidance Precautions

1. Description The applicant is expected to exercise conscientious and continuous surveillance of the airspace in which the gyroplane is being operated to guard against potential mid-air collisions. In addition to "see and avoid" practices, he is expected to use VFR Advisory Service at nonradar facilities, Airport Advisory Service at non-tower airports or FSS locations, and Radar Traffic Information Service, where available.

2. Acceptable Performance Guidelines The applicant shall maintain continuous vigilance for other aircraft and take immediate actions necessary to avoid any situation which could result in a mid-air collision. Extra precautions shall be taken, particularly in areas of congested traffic, to ensure that his view of other aircraft is not obstructed by his gyroplane's structure. When traffic advisory service is used, the applicant shall understand terminology used by the

radar controller in reporting positions of other aircraft. Failure to maintain proper surveillance shall be disqualifying.

N. Wake Turbulence Avoidance

1. Description The applicant may be asked to explain how, where, and when wingtip vortices are generated, their characteristics and associated hazards. He should follow recommended courses of action to remain clear of these hazards.

2. Acceptable Performance Guidelines The applicant shall identify the conditions and locations in which wingtip vortices may be encountered and adjust his flight path in a manner to avoid these areas. Failure to follow recommended procedures for minimizing the likelihood of flying into wingtip vortices shall be disqualifying.

III. NORMAL AND CROSSWIND TAKEOFFS AND LANDINGS (Commercial)

Objective

To determine that the applicant can competently execute takeoffs and landings in various wind conditions.

Procedures/Maneuvers

A. Normal and Crosswind Takeoffs (see II, E, on page 16).

B. Normal and Crosswind Landings (see II, F, on page 17).

IV. STRAIGHT-AND-LEVEL FLIGHT, CLIMBS, DESCENTS, AND TURNS

Objective

To determine that the applicant can competently maneuver the gyroplane while dividing his attention using instrument and outside visual references.

Procedures/Maneuvers

A. Straight-and-Level Flight

1. Description The applicant may be asked to maintain selected altitudes, headings, and airspeeds using outside references and flight instruments. This may be demonstrated in conjunction with other maneuvers, i.e., traffic patterns.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on his ability to maintain altitude, heading, and airspeed within the following tolerances:

Private		*Commercial*
±100 ft.	Altitude	±50 ft.
±10 MPH	Airspeed	±5 MPH
±10°	Heading	±5°

B. Climbs and Descents

1. Description The applicant may be asked to demonstrate climbs and descents.

He should adjust power and attitude to gain or lose altitude at a specified rate and airspeed. During power changes, sufficient rudder should be applied to counteract the effects of torque. During level-offs, power and attitude should be adjusted to return the gyroplane to straight-and-level flight. This may be demonstrated in conjunction with other maneuvers, i.e., traffic patterns.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on his ability to perform climbs and descents while remaining within the following tolerances:

Private		*Commercial*
±100 ft.	Level-off altitude	±50 ft.
±10 MPH	Airspeed	±5 MPH
±10°	Heading	±5°

C. Turns

1. Description The applicant may be asked to demonstrate turns to the left and to the right. He should apply sufficient lateral cyclic to bank the gyroplane as desired. Cyclic control should be used to maintain the desired bank, and power and attitude adjusted, as necessary, to maintain desired airspeed and altitude. During the roll-outs from turns, power and attitude should be adjusted to return to straight-and-level flight.

2. Acceptable Performance Guidelines The applicant's performance shall be

evaluated on his ability to perform turns while remaining within the following tolerances:

Private		*Commercial*
±100 ft.	Altitude	±50 ft.
±10 MPH	Airspeed	±5 MPH
±10°	Bank	±5°

D. 720° Power Turns (Commercial)

1. Description The applicant may be asked to demonstrate 720° power turns to the right and to the left. The angle of bank should be between 35° and 45°. Power and attitude should be adjusted, as necessary, to maintain desired airspeed and altitude. Turn entries and roll-outs should be accomplished accurately and smoothly.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on his ability to maintain orientation during the turns while remaining within the following tolerances:

Altitude	±100 ft.
Airspeed	±15 MPH
Heading on roll-out	±10°

V. FLIGHT MANEUVERING BY REFERENCE TO GROUND OBJECTS

Objective

To determine that the applicant can maneuver the gyroplane at approximately traffic

pattern altitude over a predetermined ground path while dividing his attention inside and outside the gyroplane.

Procedures/Maneuvers

A. Rectangular Course (Private)

1. Description The applicant may be asked to follow a rectangular or square course around and outside a selected area. He is expected to correct for wind drift so that the ground track is parallel to the sides of the selected area and equidistant from each side. A constant altitude should be maintained throughout the maneuver. This pattern should be performed both to the right and to the left.

2. Acceptable Performance Guidelines The applicant shall readily select the ground reference and maintain the desired track in relation to that reference. Properly coordinated turns, smooth control usage, and division of attention shall be required. Deviation of ± 100 ft. from the selected altitude shall be considered disqualifying unless corrected promptly. Also, excessive maneuvering to correct for wind drift, flight below minimum safe altitude prescribed by Regulations, and inadequate clearance from other aircraft shall be disqualifying.

B. "S" Turns Across a Road (Private)

1. Description The applicant may be asked to demonstrate a series of "S" turns

across a straight ground reference line approximately perpendicular to the wind. He is expected to plan bank variations to compensate for wind so that each half circle is equal on opposite sides of the line. At each reversal of direction, he should cross the line at a 90° angle in a level attitude. A constant altitude should be maintained throughout the maneuver.

2. Acceptable Performance Guidelines The applicant shall readily select ground references and maneuver the gyroplane in relation to these references. Properly coordinated turns, smooth control usage, and division of attention shall be required. Deviation of ±100 ft. from the selected altitude shall be considered disqualifying unless corrected promptly. Also, excessively steep banks, flight below minimum safe altitude prescribed by Regulations, and inadequate clearance of other aircraft shall be disqualifying.

C. Eights Along a Road (Private)

1. Description The applicant may be asked to maneuver along a ground track starting over and parallel to a road, then performing a 360° turn in each direction. He is expected to vary the bank to correct for wind so as to arrive back over the road at the starting point upon completion of each 360° turn. The ground track should be in the form of a figure "8".

2. Acceptable Performance Guidelines The applicant shall maneuver the gyroplane so the loops of the eight are symmetrical. Performance shall be evaluated on the basis of proper wind drift correction, airspeed control, coordination, altitude control, and vigilance for other aircraft. Deviation of ± 100 ft. from the selected altitude shall be considered disqualifying unless corrected promptly. Also, excessively steep banks, flight below safe altitude prescribed by Regulations, and inadequate clearance of other aircraft shall be disqualifying.

D. 720° Steep Turns about a Point (Private)

1. Description The applicant may be asked to demonstrate 720° steep turns about a point, to the left and to the right. He should follow a ground track in which the bank is varied to compensate for wind drift, so as to circle and maintain a constant radius from a prominent reference point on the ground. The angle of bank should not exceed 45° throughout the turns. Attitude and power should be adjusted during turn entries and roll-outs to maintain the desired altitude and airspeed.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his wind drift correction, airspeed control, coordination, altitude control, orientation, and vigilance for

other aircraft. Deviation of more than ±100 ft. from the selected altitude shall be considered disqualifying unless corrected promptly. Also, excessively steep banks, flight below minimum safe altitude prescribed by Regulations, and inadequate clearance from other aircraft shall be disqualifying.

E. Gliding Spirals About a Pylon (Commercial)

1. Description The applicant may be asked to demonstrate right and left gliding spirals through three full turns around a selected ground reference point. He should vary the bank to compensate for wind drift so as to circle and maintain a constant radius from the reference point. The angle of bank should not exceed 45° throughout the turns.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his wind drift correction, airspeed control, coordination, orientation, and vigilance for other aircraft. Excessively steep banks, flight below minimum safe altitude prescribed by Regulations, and inadequate clearance of other aircraft shall be disqualifying.

F. Eights Around Pylons (Commercial)

1. Description The applicant may be asked to perform right and left turns around two ground reference points or pylons. The

bank throughout each turn should be varied to correct for wind drift so as to maintain a constant radius from the pylons. The ground track is in the form of a figure "8".

2. *Acceptable Performance Guidelines* The applicant shall maneuver the gyroplane so that both loops of the "8" are of equal size. Performance shall be evaluated on wind drift corrections, airspeed control, coordination, altitude control, and vigilance for other aircraft. Deviation of ±100 ft. from the selected altitude shall be considered disqualifying unless corrected promptly. Also, excessively steep banks, flight below minimum safe altitude prescribed by Regulations, and inadequate clearance of other aircraft shall be disqualifying.

VI. MANEUVERING AT CRITICALLY SLOW AIRSPEEDS

Objective

To determine that the applicant can maintain effective control of the gyroplane while maneuvering at abnormally slow airspeeds. To determine that the applicant can recognize a high rate of descent and can accomplish prompt, positive, and effective recoveries.

Procedures/Maneuvers

A. Straight-and-level Turns, and Descents

1. Description The applicant may be asked to maneuver the gyroplane at such air-

speeds that effective control is minimized. Power and attitude should be adjusted as necessary to decelerate to and maintain the minimum possible airspeed without loss of heading or altitude. The maneuvers should include medium banked level and descending turns, as well as straight-and-level flight.

2. *Acceptable Performance Guidelines* The applicant shall be evaluated on his ability to establish the minimum possible airspeed, and to maneuver and positively control the gyroplane while remaining within the following tolerances:

Private		*Commercial*
+10 MPH	Airspeed	+5 MPH
±100 ft.	Level flight	±50 ft.
±10°	Heading	±5°

B. High Rates of Descent and Recovery

1. Description The applicant may be asked to enter a high rate of descent *with power off* and demonstrate a recovery *without power*. He should begin the maneuver by closing the throttle and placing the gyroplane in a relatively nose-high attitude. When a high rate of descent is recognized, the recovery should be accomplished by lowering the nose and establishing a normal power-off glide.

The applicant may be asked to enter a high rate of descent *with power off* and demonstrate a recovery *with power*. He should begin the maneuver by closing the throttle

and placing the gyroplane in a relatively nose-high attitude. When a high rate of descent is recognized, the recovery should be accomplished by adding full power and returning the gyroplane to straight-and-level flight. As the airspeed approaches normal cruise, power should be reduced to maintain that airspeed.

The applicant may be asked to to enter a high rate of descent *with full power* and demonstrate a recovery *without power*. He should begin the maneuver by placing the gyroplane in a relatively nose-high attitude and adding full power. When a high rate of descent is recognized, the recovery should be accomplished by closing the throttle, lowering the nose, and establishing a normal power-off glide.

The applicant may be asked to enter a high rate of descent *with full power* and demonstrate a recovery *with power*. He should begin the maneuver by placing the gyroplane in a relatively nose-high attitude and adding full power. When a high rate of descent is recognized, the recovery should be accomplished by returning to straight-and-level flight. As the airspeed approaches normal cruise, power should be reduced to maintain that airspeed.

2. Acceptable Performance Guidelines The applicant shall recognize the conditions which result in high rates of descent, and shall promptly and correctly recover from

those descents. He shall be disqualified if it becomes necessary for the examiner to take control of the gyroplane to avoid hazardous situations.

VII. CROSS-COUNTRY FLYING

Objective

To determine that the applicant can prepare for and conduct a safe, expeditious cross-country flight.

Procedures/Maneuvers

A. Flight Planning

1. Description The applicant may be asked to plan a cross-country flight to a point at least 2 hours away at the cruising speed of the gyroplane used. At least one intermediate stop should be included. Planning should include the procurement of pertinent and available weather information; plotting the course on an aeronautical chart; selecting checkpoints; measuring distances; and computing flight time, headings, and fuel requirements. The *Airman's Information Manual* should be used as a reference for airport information, NOTAMS, and such other appropriate guidance as may be extracted from its contents.

2. Acceptable Performance Guidelines All flight planning operations shall be meaningful, accurate, and applicable to the

trip proposed. The applicant shall explain his plan for the flight, verify his calculations, and present his sources of information and data.

B. Conduct of Planned Flight

1. Description The applicant may be asked to perform the planned flight using pilotage, dead reckoning, and VOR or ADF radio aids as appropriate to the equipment in the gyroplane. He should make good the desired track, determine position by reference to landmarks, and calculate estimated times of arrival over checkpoints. He may also be asked to intercept and follow a VOR radial, or an NDB bearing using ADF, recognize station passage, and determine position by means of cross bearings.

The applicant should set out on the cross-country flight which he has planned before takeoff. The planned course should be followed at least until the applicant establishes the compass heading necessary to stay on course, and can give a reasonable estimate of his groundspeed and time of arrival at his first point of intended landing.

2. Acceptable Performance Guidelines The applicant shall: (1) establish and maintain headings required to stay on course; (2) correctly identify position; (3) provide reasonable estimates of times of arrival over checkpoints and destination with an apparent

error of not more than 10 minutes; and (4) maintain altitude within ±200 ft. of the planned altitude.

C. Diversion to an Alternate

1. Description When requested by the examiner to divert to an alternate airport, as might be necessary to avoid adverse weather, the applicant is expected to turn to the new course promptly. This may be accomplished by means of pilotage, dead reckoning, or radio navigation aids.

2. Acceptable Performance Guidelines The applicant shall establish the appropriate heading for the course to the alternate and within a reasonable time give an acceptable estimate of the flying time and required fuel.

VIII. EMERGENCY PROCEDURES

Objective

To determine that the applicant can react promptly and correctly to emergencies which may occur during flight. To determine that the applicant can use techniques appropriate to "behind the power curve" situations.

Procedures/Maneuvers

A. Partial or Complete Power Malfunctions

1. Description The applicant may be asked to demonstrate a knowledge of correc-

tive actions for partial loss of power, complete power failure, rough engine, carburetor ice, and fuel starvation. The examiner may, with no advance warning, reduce power to simulate engine malfunction. The applicant is expected to perform emergency procedures for loss of power.

2. Acceptable Performance Guidelines Performance shall be evaluated on the applicant's prompt analysis of the situation and on his corrective course of action. He shall perform the emergency procedures in compliance with the manufacturer's published recommendations. Any action which creates unnecessary additional hazards shall be disqualifying.

B. Systems or Equipment Malfunctions

1. Description The applicant may be asked to demonstrate a knowledge of corrective actions for inoperative electrical system (generator, alternator, battery or circuit breaker) and electrical fire or smoke in cockpit. Where practicable, the examiner may, with no advance warning, simulate a malfunction. The applicant is expected to perform the appropriate emergency procedures.

2. Acceptable Performance Guidelines Performance shall be evaluated on the applicant's prompt analysis of the situation and his corrective actions. He shall perform the emergency procedures in compliance with

the manufacturer's published recommendations. Any action which creates unnecessary additional hazards shall be disqualifying.

C. Lost Procedures

1. Description The applicant may be asked to explain the proper courses of action to be taken in the event he becomes lost, is trapped on top of an overcast, loses radio communications, or encounters unanticipated adverse weather.

2. Acceptable Performance Guidelines Performance shall be evaluated on the applicant's ability to promptly analyze the situation and describe the appropriate corrective action.

D. Simulated Liftoff at Low Airspeed and High Angle of Attack (Commercial)

1. Description The applicant may be asked to demonstrate a takeoff using less than full available power, thus simulating a "behind-the-power-curve" situation. The rotation for takeoff should be initiated prior to reaching normal liftoff airspeed. Once airborne, at low airspeed and with the rotor disc at a high angle of attack, the nose should be lowered as necessary to accelerate so as to establish a climb. Power should be limited until the maneuver has been satisfactorily demonstrated. Full power should be applied,

however, *anytime* it becomes necessary to prevent a hazardous situation.

2. *Acceptable Performance Guidelines* The applicant's performance shall be evaluated on his judgment and technique. Failure to add full power when needed, or continuing the takeoff run when the aircraft will obviously not become airborne, shall be disqualifying.

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